INDEX TO SURGICAL PROGRESS.

GENERAL SURGERY.

I. Cancer Parasites. By DR. H. NOESSKE. A special group of cell inclusions have been described by various authors, especially Plimmer, as parasites. Noesske has found these in various gland cancers, especially in mammary carcinomata, while he has missed them entirely in epitheliomata. These bodies have nothing to do with parasites, being characteristic vacuolated formations, the development of which Noesske has followed step by step. They begin in the form of fine vesicles in the protoplasm, generally close to the cell nucleus, contain a substance capable of coagulation, and, according to the amount and concentration of this material, go on to the formation of one or more granules (usually central) and of the characteristic peripheral contours. Often fine fibres and clots are recognizable scattered within these bodies. They may be found in benign growths and in normal gland tissue.

The similarity of the cell inclusions to the myxamœba stage of Plasmidiophora brassicæ (the cause of Kohl hernie) is only superficial and apparent. The cancer parasites recently described by Feinberg are identical with Plimmer's bodies, and cannot withstand earnest criticism. To-day there is no proof of the parasitic origin of cancer. The author doubts the correctness of the statistics which show an apparent increase in the prevalence of cancer.—*Verhandlungen der deutschen Gesellschaft für Chirurgie,* 1902.

II. Micrococcus Neoformans and the Treatment of Cancer. By DR. E. DOYEN (Paris). On November 25, 1901, Doyen announced to the Academy of Medicine the discovery of a round

microbe arranged in chains of six or eight links, which he found in cancers, and especially in cancerous lymph glands. The microbes are difficult to cultivate. If they are cultivated on a suitable medium, they may afterwards be transplanted to other media. On agar-agar they form a grayish, viscid scum and slowly liquefy the gelatin. The organism is destroyed through a twelve-hour exposure to a temperature of 55° to 60° (130° to 140° F.). Cultures are most readily obtained from points remote from the original focus of the disease, *i.e.*, the centre of the cancer is very often sterile. In sections it is difficult to demonstrate the micrococcus, yet it can be done with thionine or safranine. Gram's method combined with carmin shows a small number of single or double diplococci.

Doyen has found the organism in the most varied tumors,—in cancer of the breast and its lymphatic glands, in cancer of the uterus, stomach (secondary nodules, also), of the ovaries, rectum and its peritoneal metastases, in proliferating cystomata of the mammæ and ovaries, in rapidly progressive struma of the thyroid, in pleural sarcomata, in spindle-celled sarcoma of the cervical glands, in muscle sarcomata, and in rapidly growing lipomata of the vas, etc.

In another list of tumors no cultures were possible. In all these there was no recurrence (dead tumors). Recurrence was very quick whenever cultures were very successful.

Inoculations with virulent cultures produced in a bitch two encapsulated lipomata, in guinea-pigs cellular growths in the mammæ and cylindrical epithelial growths in the liver. In testicles the microbes were destroyed by phagocytes. The phagocytosis is worthy of study.

The pathogenesis of human tumors appears to consist in an irritation of the normal body elements, which by means of division and increase carry on a fight against the inroads of the micrococcus neoformans.

If the phagocytic power of the proliferating cells prevails,

the tumor ceases to grow, but microbes can remain latent in it. Under such circumstances, an originally benign tumor may become malignant. If the tumor has assumed malignant characteristics, the primary focus may remain absolutely or relatively sterile, the secondary nodules being virulent. Sarcomata remain stationary longer than epitheliomata because of the greater vitality of the mesoderm cells. This also explains the more rapid infection of the lymphatics in cancer than in sarcoma.

Injections of the toxins of micrococcus neoformans, modified by treatment with hydrochlorate of quinine and kakodyl, give a noticeable reaction and, in not too severe cases, do good.

In severe cases it is necessary to follow the treatment proper by the injection of a different fluid of special activity, which after a time gives rise to marked changes in the neoplasm. If the action of this second fluid is too strong, an antitoxin is injected.

Albert Robin, Roux, Metschnikoff, and Labadie-Lagram have superintended the treatment in several inoperable cases. Several tumors are now in the stage of resorption, without necrosis, the tumor tissue being gradually replaced by healthy.

The author concludes, "I will only remark that I have succeeded in obtaining, in more than 400 cases, from pieces of tumor pure cultures of a microbe which is pathogenic in animals, and that, based on this, I have instituted a new method of treatment which has proven superior to previous means in cases of inoperable disease."—*Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1902.

III. Intramuscular Bone Formation after Trauma. By DR. VULPIUS (Heidelberg). Bone may be formed in muscle after repeated trauma or after a single injury. The latter may be due to development from a dislocated portion of periosteum (Berndt) or to true intramuscular bone formation. The author reports a case of this purely intramuscular development.

Workman, aged twenty-one years, fell, hitting his thigh. After three weeks unable to work. Progressive stiffness of knee.

After ten weeks, removal by operation of a hard, freely mobile tumor lying in the quadriceps. The specimen proved to be a bone cyst, entirely intramuscular in location. It was covered by a glistening membrane, which sent prolongations as septa into the lumen. Contents were blood-stained serum. The periosteum of the femur was intact. Around the cyst there were a few scattered callosities in the connective tissue, with partially ossified foci.

Such cysts of traumatic origin have been very rarely described (two cases). The most evident explanation of their etiology is that a new formation of bone is excited in the connective tissue surrounding the extravasated blood. Why the connective tissue should be excited by the trauma to form bone is as obscure as the cause of the analogous progressive ossifying myositis.—*Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1902.

IV. The Transplantation of Dead Bone into Indifferent Soft Parts, alone or in Connection with Living Periosteum. By DR. SULTAN (Königsberg i/Pr.) The following results are grounded on experiments on dogs. When a piece of fresh bone without periosteum is implanted in muscle, the bone-cells die and the bone is absorbed. Portions of the medullary bone may remain alive and form new bone, but this new formation is so slight as to be out of all proportion to the resorption.

When a portion of bone covered by periosteum is implanted in muscle, there is also a death of bone-cells, but the periosteum remains lively and forms new bone to replace the dead.

If portions of bone, killed by boiling, are wrapped up in pedunculated flaps of periosteum (the dead bone being in contact with the osteal surface of the periosteum), the periosteum proceeds to form new bone with rapidity. The new bone penetrates the dead and seems to increase at its cost.

The chances of new bone formation after the transplantation of non-pedunculated, *i.e.*, free portions of periosteum, are in-

creased if the membrane is folded or rolled up with its osteogenetic layer inside.—*Verhandlungen der deutschen Gesellschaft für Chirurgie,* 1902.

V. Nature's Means of Obtunding Pain. By DR. RITTER (Greifswald). It is generally supposed that pain in inflammation is due to pressure by exudates exerted on the nerves. This explanation does not agree with a number of facts. Hot baths, hot sand, and hot air relieve pain enormously in many chronic inflammations, and yet, according to Bier, they act by exciting a high grade of arterial hyperæmia. The artificial hyperæmia produced in Bier's treatment of various chronic inflammations increases pressure, but relieves pain. The same relief of pain was observed by Ritter in treating a case of frost-bite by artificial hyperæmia. Schleich's method of local anæsthesia by infiltration increases pressure.

Ritter, after examination of the power of perceiving pain in the most varied forms of inflammation, finds that in all acute inflammations the perceptive power increases quickly, but that as soon as serous infiltration (œdema) appears in the tissues, it markedly diminishes. These observations were made not merely in cases of various infective inflammations, but also of traumatism. Even in inflammation of the skin (*e.g.,* erysipelas) there is at first increased perception of pain, but later, when the tissues are tensely infiltrated, the pain perception is lowered.

Ritter carried out a series of experiments on himself, producing artificial hyperæmia and inflammation. He found that hyperæmia, whether produced by bandages or by cupping, always diminished the perception of pain, while inflammatory arterial hyperæmia increased it to begin with, but that as soon as exudation was established the power of perception of pain always became lower than normal. Schleich bases his method of producing local anæsthesia on the fact that non-inflammatory œdema lowers the sensibility of the tissues. Inflammatory œdema is

comparable to the wheals produced by the Schleich injections, which *immediately* occasion pain, later, anæsthesia.

Braun believes that the anæsthetic effect of Schleich's injections depends on the osmotic tension of the fluid used. May this not be the explanation of the phenomena observed in inflammatory infiltration?

By determination of the freezing point of fluids obtained from inflammatory swellings, Ritter found a distinct increase of the osmotic pressure compared to that of the normal tissue fluids.

v. Koranyi has shown that normally the concentration of the tissue juices varies according to the destruction of albumen in metabolism, and Ritter points out that in the various forms of inflammation, etc., there is an increased destruction of albumen (necrosis of tissue). In all probability, then, it is due to increased destruction of albumen that the juices in inflammatory exudates are of a high tonicity.

The conclusion is evident that the pain in inflammation is not due to the pressure of exudates, but to their increased concentration. Anæsthesia rapidly follows the early pain. This anæsthesia is not desirable, as it is often a source of danger to the tissues, as a complete anæsthesia is equal to death of the affected cells. However, v. Koranyi has shown that the body does not submit passively to the increased concentration of the inflammatory fluids, but endeavors to prevent or dilute them. This dilution is attained by osmosis, the blood and serum flowing towards the fluid of high osmotic tension.

Ritter has observed, contrary to former investigators, that every chemical injected into the skin produces a hyperæmia in the neighborhood. The stronger the concentration of the chemical, the greater the hyperæmia or serous infiltration. When isotonous fluids are used, the hyperæmia is least, when serum is injected, it is almost absent. The influence of this hyperæmia on the sense of pain is proved by the injection of normal salt

solution, which neither produces hyperæmia, pain, nor anæsthesia.

From this investigation, it follows that one must consider hyperæmia (whether arterial or venous) and serous infiltration Nature's means of alleviating pain by lowering the injuriously high concentration. Normally, this method of alleviating pain acts very promptly, but in severe injuries and in the anæmic it is often delayed. Under such circumstances one may artificially produce or increase it (1) by all so-called counterirritants (according to Ritter it is impossible to produce an inflammatory hyperæmia without injuring the tissues); (2) the most effective and least injurious means is that suggested by Bier, viz., artificial stasis, cupping, Junod's boot, and hot air.—*Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1902.

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